

Chapter 6

TCP/IP Basics



Episode 6.01

Episode title: **Introduction to IP Addressing and Binary**

Objective: **1.7 Given a scenario, use appropriate IPv4 network addressing.**

L3s

Dotted-Decimal Notation

Each octet is valued between 0 and 255

Congratulations!

11000101 = 197

00001110 = 14

10101010 = 170

L3s

00000000 = 0

11111111 = 255

Converting 171 from decimal to binary

171 in binary is 10101011

Converting 224 from decimal to binary

224 in binary is 11100000

Converting 95 from decimal to binary

95 in binary is 01011111



Episode 6.02

Episode **Introduction to ARP**
title:

Objective: **5.5 Given a scenario, use the appropriate tool or protocol to solve networking issues**

L3s

ARP (Address Resolution Protocol)

ARP resolves MAC addresses from IP addresses



Episode 6.03

Episode **Subnet Masks**
title:

Objective: **1.7 Given a scenario, use appropriate IPv4 network addressing.**

L3s

Cannot use 0- 255 for the Host ID

The Subnet Mask is only used by the computer- it is never sent out

232.25.208.xxx/24

The Default Gateway will figure out where to forward the message

Fixed Length Subnet Mask (FLSM)

Variable Length Subnet Mask (VLSM)



Episode 6.04

Episode **Classful Addressing**
title:

Objective: **Test goes here**

L3s

Class licenses

Class A 0-126 /8

Class B 128-191 /16

Class C 192-223 /24

Subnetting divides Network IDs into two or more networks

Subnets don't have to be on the dots



Episode 6.05

Episode **Subnetting with CIDR**
title:

Objective: **Test goes here**

L3s

Classless Inter-Domain Routing (CIDR)

160.25.208.1

(281)-555-1212

2815551212

160.25.208.1

10100000000110011101000000000001

208.25.160.0 /24

L3s

208.25.160.0 /25

208.25.160.128 /25

2 Subnets, 126 Host per Subnet

4 Subnets, 62 Hosts per Subnet

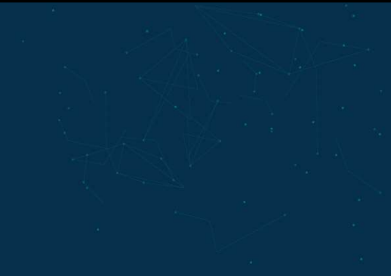


Episode 6.06

Episode title: **More CIDR Subnetting Practice**

Objective: **1.7 Given a scenario, use appropriate IPv4 network addressing.**

No L3s or QR, just subnet
practicing





Episode 6.07

Episode **Dynamic and Static IP Addressing**
title:

Objective: **1.4 Explain common networking ports, protocols, services, and traffic types.**
3.4 Given a scenario, implement IPv4 and IPv6 network services

L3s

Dynamic IP Address

Static IP Address

/24 = 254 Hosts

/24 = 254 Hosts

/25 = 126 Hosts

/26 = 62 Hosts

/27 = 30 Hosts

L3s

/28 = 14 Hosts

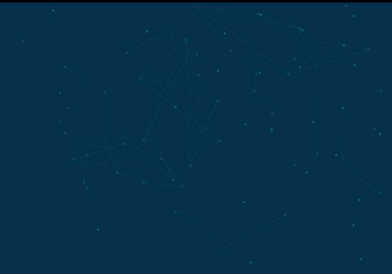
/29 = 6 Hosts

/30 = 2 Hosts

/31 = 0 Hosts

Subnet Mask

Network ID





Episode 6.07

Episode title:	Dynamic and Static IP Addressing
Objective:	1.4 Given a scenario, configure a subnet and use appropriate IP addressing schemes
	3.4 Given a scenario, implement IPv4 and IPv6 network services
	5.5 Given a scenario, use the appropriate tool or protocol to

L3s

Static (manual) assignment

Dynamic (automatic) assignment

**Dynamic Host Configuration Protocol
(DHCP)**

BOOTP in Linux

**Each broadcast domain must only have
one DHCP server**

**DHCP server must be run within the
broadcast domain**

L3s

ipconfig

ifconfig in Linux

DHCP lease time

DCHP pool/scope

IP address reservation

Exclusion ranges



Episode 6.08

Episode **Special IP Addresses**
title:

Objective: **1.7 Given a scenario, use appropriate IPv4 network addressing.**

L3s

10.X.X.X

172.16.x.x - 172.31.x.x -> private IP address

192.168.x.x -> private IP address

NAT device

Loopback address

Loopback adaptor

IPv4 loopback - 127.0.0.1

L3's

IPv6 loopback - ::1

**APIPA (Automatic Private IP
Addressing)**

APIPA - 169.254.x.x



Episode 6.09

Episode **IP Addressing Scenarios**
title:

Objective: **Test goes here**

L3s

Duplicate IP address

ipconfig

ifconfig

Duplicate MAC address

Incorrect gateway

Incorrect netmask

Expired IP address